CLAIMS

What is claimed is:

1. A charging system to charge a battery of a robot, comprising:

a charger;

a first charging part provided in the charger and including a high-frequency current generator to rectify commercial power and to convert the rectified power into a high-frequency square wave signal, a primary induction coil to generate an electromagnetic field by the high-frequency square wave signal supplied from the high-frequency current generator, and a first terminal part to emit the electromagnetic field created by the primary induction coil; and

a second charging part provided in the robot and including a second terminal part to mate with the first terminal part, a secondary induction coil to generate an induced current by the electromagnetic field emitted from the first charging part, and a DC converter to rectify the induced current generated from the secondary induction coil and to supply DC power to the battery.

2. The charging system according to claim 1, wherein the first terminal part comprises:

a terminal member movable relative to the charger; and

an elastic member interposed between the terminal member and the charger.

3. The charging system according to claim 1, wherein the second terminal part comprises:

a terminal member movable relative to the robot; and

an elastic member interposed between the terminal member and the robot.

4. The charging system according to claim 1, further comprising:

a protrusion and a protrusion accommodating part provided in the second terminal part and the first terminal part, respectively.

5. The charging system according to claim 4, wherein at least one of the protrusion and the protrusion accommodating part is provided with guiding slants.

6. The charging system according to claim 4, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction transverse to a docking direction.

7. The charging system according to claim 2, further comprising:

a protrusion and a protrusion accommodating part provided in the second terminal part and the first terminal part, respectively.

8. The charging system according to claim 7, wherein at least one of the protrusion and the protrusion accommodating part is provided with guiding slants.

9. The charging system according to claim 7, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction transverse to a docking direction.

10. The charging system according to claim 3, further comprising:

a protrusion and a protrusion accommodating part provided in the second terminal part and the first terminal part, respectively.

11. The charging system according to claim 10, wherein at least one of the protrusion and the protrusion accommodating part is provided with guiding slants.

12. The charging system according to claim 10, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction transverse to a docking direction.

13. The charging system according to claim 1, further comprising:

a charging controller provided in the second charging part to transmit a control signal to the charger.

14. The charging system according to claim 13, wherein the first charging part further comprises:

a first wireless communication part to allow communication between the charger and the robot; and

a power controller to control an inverter of the high-frequency current generator in response to the control signal transmitted from the charging controller through the first wireless communication part.

15. The charging system according to claim 14, wherein the second charging part further comprises:

a second wireless communication part to communicate with the charger,

wherein the charging controller controls the power controller through the second wireless communication part.

16. The charging system according to claim 8, wherein the elastic member comprises:

a spring elastically deformable to absorb shocks when the protrusion is accommodated in the protrusion accommodating part.

17. The charging system according to claim 11, wherein the elastic member comprises:

a spring elastically deformable to absorb shocks when the protrusion is accommodated in the protrusion accommodating part.

18. The charging system according to claim 4, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction vertical to a docking direction.

19. The charging system according to claim 7, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction vertical to a docking direction.

20. The charging system according to claim 10, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction vertical to a docking direction.

21. The charging system according to claim 4, wherein the protrusion and the protrusion accommodating part are provided so that the robot contacts the charger within a charging position even if a position of the robot is not precisely controlled.

22. The charging system according to claim 21, wherein the battery of the robot is charged even when the position of the robot is not precisely controlled.

23. The charging system according to claim 7, wherein the protrusion and the protrusion accommodating part are provided so that the robot contacts the charger within a charging position even if a position of the robot is not precisely controlled.

24. The charging system according to claim 23, wherein the battery of the robot is charged even when the position of the robot is not precisely controlled.

25. The charging system according to claim 10, wherein the protrusion and the protrusion accommodating part are provided so that the robot contacts the charger within a charging position even if a position of the robot is not precisely controlled.

26. The charging system according to claim 25, wherein the battery of the robot is charged even when the position of the robot is not precisely controlled.

27. The charging system according to claim 1, wherein the battery of the robot is charged without electrical contact between the robot and the charger.

28. The charging system according to claim 1, further comprising:

a protrusion and a protrusion accommodating part provided in the first terminal part and the second terminal part, respectively.

29. A charging system to charge a battery of a robot, comprising:

a charger;

a first charging unit provided in the charger to generate an electromagnetic field, and including a first terminal part to emit the electromagnetic field; and

a second charging part provided in the robot and including a second terminal part to mate with the first terminal part, to generate an induced current by the electromagnetic field emitted from the first charging part, supplying power to the battery.

30. The charging system according to claim 29, further comprising:

a protrusion and a protrusion accommodating part provided in the second terminal part and the first terminal part, respectively.

31. The charging system according to claim 30, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction transverse to a docking direction.

32. The charging system according to claim 30, wherein the protrusion is accommodated in the protrusion accommodating part, leaving a margin in which the protrusion is movable in a direction vertical to a docking direction.

33. A charging system having a charger to charge a battery of a robot, comprising:

a first charging unit provided in the charger to generate an electromagnetic field, and including a first terminal part to emit the electromagnetic field; and

a second charging part provided in the robot and including a second terminal part to mate with the first terminal part, to generate an induced current by the electromagnetic field emitted from the first charging part, supplying power to the battery,

wherein the battery of the robot is charged without electrical contact between the robot and the charger.